Docket 87286AJA
Customer No. 01333

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of	Group Art Unit: 2878
Ronald S. Cok	Examiner: Thanh X. Luu
AMBIENT LIGHT DETECTION CIRCUIT WITH CONTROL CIRCUIT FOR INTEGRATION PERIOD SIGNAL	
Serial No. 10/736,340	
Filed 15 December 2003	

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Commissioner for Patents
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Sir:

APPEAL BRIEF PURSUANT TO 37 C.F.R. 1.192

Applicants hereby appeal to the Board of Patent Appeals and Interferences from the Examiner's Final Rejection of claims 1-18 which was contained in the Office Action mailed October 13, 2006.

A timely Notice of Appeal was mailed with Certificate of First Class mailing January 16, 2007, and received at OIPE on January 19, 2007.

Respectfully submitted,

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Table Of Contents

Table Of Contents i
Real Party In Interest 1
Related Appeals And Interferences 1
Status Of The Claims 1
Status Of Amendments 1
Summary Of Claimed Subject Matter 1
Grounds Of Rejection To Be Reviewed On Appeal 3
Arguments 3
  Anticipation Rejection of Claims 1 and 2 over Riedel 3
  Obviousness Rejection of Claims 3-11 over Riedel 5
  Obviousness Rejection of Claims 12-18 over Toshiba in view of Riedel 6
Conclusion 7
Appendix I - Claims on Appeal 8
Appendix II - Evidence 12
Appendix III – Related Proceedings 13

Real Party In Interest

Eastman Kodak Company is assignee and the real party in interest.

Related Appeals And Interferences

No appeals or interferences are known which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

Status Of The Claims

Claims 1-18 are pending in the application.

Claims 1 and 2 stand rejected under 35 USC § 102.

Claims 3-18 stand rejected under 35 USC § 103.

Claims 1-18 are being appealed.

Appendix I provides a clean, double spaced copy of the claims on appeal.

Status Of Amendments

No amendmend has been requested subsequent to the Final Rejection mailed October 13, 2006.

Summary Of Claimed Subject Matter

Independent claim 1 is directed towards a circuit (10) for detecting light comprising: a) a light-integrating photo-sensor circuit (12, 12a/12b) having one or more thin-film photosensors (14) (page 9, lines 13-21) and being responsive to a variable integration period signal (32) and to ambient light (page 4, line 18, as detected by photosensor 14) for producing a photo signal (20) representing the intensity of the ambient light, wherein the photo signal (20) may be in one of at least three states including a no-signal state (72), an in-range state (74), and a saturated state (70); and b) a control circuit (30) for receiving the photo signal (20) and automatically increasing the period of the integration period signal (32) when the photo signal (20) is in the no-signal state (72) and decreasing the period of the integration period signal (32) when the photo signal is in the

saturated state so as to result in the photo signal (20) being in the in-range state and producing a corresponding ambient light signal.

Independent 12 is directed towards a flat-panel display (40), comprising: a) a substrate (43) and a plurality of light-emitting elements (42) located thereon in a display area (41); and b) a circuit (10) for detecting light incident on the flat-panel display (40) comprising: i) a light-integrating photo-sensor circuit (12, 12a/12b) having one or more thin-film photosensors (14) located on the substrate and being responsive to a variable integration period signal (32) and to ambient light (page 4, line 18, as detected by photosensor 14) for producing a photo signal (20) representing the intensity of the ambient light incident on the flat-panel display (40), wherein the photo signal (20) may be in one of at least three states including a no-signal state (72), an in-range state (74), and a saturated state (70); and ii) a control circuit (30) for receiving the photo signal (20) and automatically increasing the period of the integration period signal (32) when the photo signal (20) is in the no-signal state (72) and decreasing the period of the integration period signal when the photo signal (20) is in the saturated state so as to result in the photo signal (20) being in the in-range state (74) and producing a corresponding ambient light signal.

Independent claim 18 is directed towards a method for controlling a flat-panel display (40), comprising: a) providing a flat-panel display (40) comprising a substrate (43) and a plurality of light-emitting elements (42) located thereon in a display area (41); b) providing a light-integrating photo-sensor circuit (12, 12a/12b) having one or more thin-film photosensors (14) located on the substrate and responding to a variable integration period signal (32) and to ambient light (page 4, line 18, as detected by photosensor 14) for producing a photo signal (20) representing the intensity of the ambient light incident on the flat-panel display (40), wherein the photo signal (20) may be in one of at least three states including a no-signal state (72), an in-range state (74), and a saturated state (70); c) iteratively receiving the photo signal (20) and automatically increasing the period of the integration signal (32) when the photo signal (20) is in the no-signal state (72) and decreasing the period of the integration signal (32) when the photo signal (20) is in the saturated state so as to result in the photo signal (20) being in the in-range state (74) and producing a corresponding ambient

light signal; and d) adjusting the brightness of the flat-panel display (40) in response to the ambient light signal.

The present claimed invention enables an improved dynamic range for thin-film photosensors, particularly when used with a lfat-panel display (page 3, lines 28-29).

Grounds Of Rejection To Be Reviewed On Appeal

1. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Riedel USP 6,150,124.

2. Claims 3-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riedel USP 6,150,124.

3. Claims 12-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Toshiba JP 2002-297096 in view of Riedel.

Arguments

Anticipation Rejection of Claims 1 and 2 over Riedel

Contrary to the Examiner's assertion, there is no teaching in Riedel with respect to a circuit which automatically changes the period of an integration signal to an integrating photosensor circuit employing a thin-film photosensor in response to a determination that the photo signal produced by the photosensor circuit is in one of three distinct states (i.e., a no-signal, in-range, and saturated signal states) so as to result in the photo signal being in the in-range state and producing a corresponding ambient light signal, as required in accordance with the claimed invention. While it is of course possible that a photo signal of Riedel may fall into one of these distinct states, there is simply no teaching of a control circuit to automatically correct the integration period so as to maintain the signal in an in-range state in response to a determination that the photo signal is one of the other states. Note specifically that a "low" ambient light level as referenced by Riedel at col. 5, line 40 does not necessarily imply a no-signal state, and a "high" ambient light level as referenced at col. 5, lines 41-42 does not necessarily imply a saturated signal state. Additionally, there is no disclosure in Riedel with respect to photodetector 18 comprising a thin-film photosensor (see present

application page 9, lines 13-21) as required by the rpesent invention., rather than, e.g., a conventional photosensor constructed on a silicon substrate. The present anticipation rejection accordingly represents clear error on these points alone.

There is further no support for the Examiner's contention that col. 6, lines 8-10 in combination with col. 5, lines 40-44 of Riedel teaches a control circuit (microprocessor, not shown) for receiving the photo signal and automatically increasing the period of integration period signal when the photo signal is in the no-signal state, and decreasing the period of the integration period signal when the photo signal is in the saturated state so as to result in the photo signal being in the in-range state and producing a corresponding ambient light signal. Reidel teaches the use of a photodetector in a system for determining the amount of ambient light transmitted through a reagent and/or sample fluid on an analyte strip, and suggests at col. 5, lines 31-44 (which includes lines 40-44 referenced by the Examiner) periodic sampling and integration of the output of the photodetector, with an observation that longer integration times may be used for low ambient light levels and shorter integration times may be used for high ambient light levels in the fluid sample analyzer system. As discussed at col. 6, lines 8-21 (which includes lines 8-10 referenced by the Examiner), however, rather than anticipate the claimed invention, this change in integration time is specifically taught only for use in increasing the signal-to-noise ratio of the measured response with respect to the difference between the unhydrated response and the maximum hydrated response in the disclosed sample fluid testing method as illustrated in Fig. 6. There is simply no teaching in Reidel in such cited passages (or elsewhere) with respect to automatically increasing the period of integration period signal when the photo signal is in a no-signal state, and decreasing the period of the integration period signal when the photo signal is in a saturated state so as to result in the photo signal being in the in-range state and producing a corresponding ambient light signal (as opposed to an analyzed fluid signal) as alleged by the Examiner. Thus, the Examiner's reliance upon such sited sections for the contention that Riedel anticipates the present invention accordingly represents clear error.

The Examiner's further contention that "since a microprocessor is used and there is no user intervention, as understood, the system of the prior

art 'automatically' performs the claimed function as claimed" also represents clear error. The Examiner has improperly taken the omission of any specific teaching in Riedel with respect to how the proposed change in integration time might be performed as a positive teaching that it must necessarily be "automatically" done in response to a specific signal state. There simply is no basis for such contention. To the contrary, rather than anticipate the present invention, the integration time change proposed in Riedel might just as well be done based on user instructions. There is in any event no teaching with respect to performing any such change in integration time in response to a detected no-signal or saturated state, as opposed to simply modifying an in-range state photo signal to provide a more desirable signal-to-noise ratio. For all the above reasons, the anticipation rejection represents clear error and should be reversed.

Obviousness Rejection of Claims 3-11 over Riedel

This rejection also represents clear error, to the extent it is based on the erroneous interpretations of the Riedel reference as set forth above. As there is no teaching in Riedel with respect to automatically changing the period of an integration signal to an integrating photosensor circuit in response to no-signal, in-range, and saturated signal states, even if substitution of further features as proposed by the Examiner were to be made in Riedel for the purposes proposed by the Examiner, the present invention still would not be obtained. Further, as Riedel is directed towards a different problem (i.e., increasing signal-to-noise ratio of the measured response with respect to the difference between an unhydrated response and a maximum hydrated response of a fluid) than that of the present invention (improving the dynamic range for thin-film photosensors, particularly for use with a flat-panel display), a prima facie case of obviousness has clearly not been established as to modifying the teachings of Riedel so as to obtain a circuit in accordance with the present invention. Such rejection accordingly represents clear error and should be reversed.

Further with respect to claim 10, it is also noted the Examiner has not identified any teaching in Riedel (or elsewhere in the prior art), or otherwise established a basis for any alleged prima facie case of obviousness, with respect to use of a digital counter (see, e.g., page 9, lines 1-12 of the specification) for generating an integration period signal in response to a determination of whether a photosignal is in one of three states as discussed above in order to generate an in-range photosignal when employing a thin-film photosensor. Such simple structure is advantageous in that it does not require a sophisticated microprocessor as generally is required in the system of Riedel, and therefore enables reduced costs.

Obviousness Rejection of Claims 12-18 over Toshiba in view of Riedel

This rejection also represents clear error, to the extent it is based on the erroneous interpretations of the Riedel reference as set forth above. As there is no teaching in Riedel with respect to automatically changing the period of an integration signal to an integrating photosensor circuit in response to no-signal, in-range, and saturated signal states, even if the light detector system of Riedel were to be provided in the apparatus of Toshiba as proposed by the Examiner, the display of claim 12 and method of controlling a display of claim 18 still would not be obtained. Further, as Riedel is directed towards a different problem (i.e., increasing signal-to-noise ratio of the measured response with respect to the difference between the unhydrated response and the maximum hydrated response of a fluid) rather than detecting ambient light level itself as desired in Toshiba and the present invention, a prima facie case of obviousness with respect to modifying the teachings of Riedel in the proposed combination of Riedel and Toshiba so as to result in the present claimed invention has clearly not been established. Such rejection accordingly represents clear error and should be reversed.

Conclusion

For the above reasons, Appellants respectfully request that the Board of Patent Appeals and Interferences reverse the rejection by the Examiner and mandate the allowance of Claims 1-18.

Respectfully submitted,

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If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

Appendix I - Claims on Appeal

1. A circuit for detecting light comprising:

a) a light-integrating photo-sensor circuit having one or more thin-film photosensors and being responsive to a variable integration period signal and to ambient light for producing a photo signal representing the intensity of the ambient light, wherein the photo signal may be in one of at least three states including a no-signal state, an in-range state, and a saturated state; and

b) a control circuit for receiving the photo signal and automatically increasing the period of the integration period signal when the photo signal is in the no-signal state and decreasing the period of the integration period signal when the photo signal is in the saturated state so as to result in the photo signal being in the in-range state and producing a corresponding ambient light signal.

2. The circuit claimed in claim 1, wherein the photosensor is a photodiode.

3. The circuit claimed in claim 1, wherein the photosensor is a photo capacitor.

4. The circuit claimed in claim 1, wherein the photosensor is a phototransistor.

5. The circuit claimed in claim 1, wherein the photosensor is an organic photosensor.

6. The circuit claimed in claim 1, wherein the photosensor is a silicon photosensor.

7. The circuit claimed in claim 1, wherein the photo-signal states are represented by digital signals.

8. The circuit claimed in claim 1, wherein the photo-signal states are represented by analog signals.

9. The circuit claimed in claim 1, wherein the value of the integration period signal is stored as a digital value.

10. The circuit claimed in claim 1, wherein the integration period signal is generated by a digital counter.

11. The circuit claimed in claim 1 further comprising a plurality of photosensor circuits producing a plurality of respective photo signals and wherein the control circuit is responsive to the plurality of photo signals.

12. A flat-panel display, comprising

a) a substrate and a plurality of light-emitting elements located thereon in a display area; and

b) a circuit for detecting light incident on the flat-panel display comprising:

i) a light-integrating photo-sensor circuit having one or more thin-film photosensors located on the substrate and being responsive to a variable integration period signal and to ambient light for producing a photo signal representing the intensity of the ambient light incident on the flat-panel display, wherein the photo signal may be in one of at least three states including a no-signal state, an in-range state, and a saturated state; and

ii) a control circuit for receiving the photo signal and automatically increasing the period of the integration period signal when the photo signal is in the no-signal state and decreasing the period of the integration period signal when the photo signal is in the saturated state so as to result in the photo signal being in the in-range state and producing a corresponding ambient light signal.

13. The circuit claimed in claim 12, wherein the photosensor circuit includes a detector circuit and wherein the detector circuit and/or the control circuit is a thin-film device located on the substrate.

14. The circuit claimed in claim 12, wherein the photosensor circuit includes a detector circuit and wherein the detector circuit and/or the control circuit are located externally to the substrate.

15. The flat-panel display claimed in claim 12, wherein the display area is rectangular and the photosensor is located at an edge or a corner of the rectangular display area.

16. The display claimed in claim 12, wherein the light emitting elements are organic light emitting diodes.

17. The display claimed in claim 12 further comprising a plurality of photosensor circuits producing a plurality of respective photo signals and wherein the control circuit is responsive to the plurality of photo signals.

18. A method for controlling a flat-panel display, comprising:

a) providing a flat-panel display comprising a substrate and a plurality of light-emitting elements located thereon in a display area;

b) providing a light-integrating photo-sensor circuit having one or more thin-film photosensors located on the substrate and responding to a variable integration period signal and to ambient light for producing a photo signal representing the intensity of the ambient light incident on the flat-panel display, wherein the photo signal may be in one of at least three states including a no-signal state, an in-range state, and a saturated state;

c) iteratively receiving the photo signal and automatically increasing the period of the integration signal when the photo signal is in the no-signal state and decreasing the period of the integration signal when the photo signal is in the saturated state so as to result in the photo signal being in the in-range state and producing a corresponding ambient light signal; and

d) adjusting the brightness of the flat-panel display in response to the ambient light signal.

Appendix II - Evidence

NONE

Appendix III – Related Proceedings

NONE